

WHAT IS CLAIMED IS:

1. A communication apparatus comprising:  
a radio frequency (RF) circuit for operating on a radio frequency signal; and  
5 a digital processing circuit coupled to the RF circuit, wherein the digital processing circuit includes:  
a first bus master coupled to a bus;  
one or more other bus masters coupled to the bus; and  
configured to arbitrate between requests to access the bus by the first bus  
10 master and the one or more other bus masters;  
wherein accesses by the one or more other bus masters to the bus are restricted in response to a signal indicative of a change in a mode of operation of the RF circuit.
- 15 2. The communication apparatus as recited in Claim 1 wherein the signal is indicative of a change to an active mode of operation of the RF circuit.
3. The communication apparatus as recited in Claim 2 wherein the signal indicates a change to a transmission mode of operation of the RF circuit.  
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4. The communication apparatus as recited in Claim 2 wherein the signal indicates a change to a reception mode of operation of the RF circuit.
5. The communication apparatus as recited in Claim 2 wherein the signal is asserted  
25 a predetermined amount of time prior to the change to the active mode of operation of the RF circuit.

6. The communication apparatus as recited in Claim 1 wherein the signal is asserted a predetermined amount of time prior to a shutdown mode of operation of the digital processing circuit.
- 5 7. The communication apparatus as recited in Claim 1 wherein the signal indicative of a change of mode of operation of the RF circuit is generated by a timing circuit.
8. The communication apparatus as recited in Claim 1 wherein the first bus master is provided exclusive access to the bus in response to assertion of the signal.
- 10 9. The communication apparatus as recited in Claim 1 wherein the first bus master is a microcontroller unit (MCU).
10. The communication apparatus as recited in Claim 1 wherein the first bus master is a digital signal processor (DSP).
- 15 11. The communication apparatus as recited in Claim 9 wherein an interrupt signal is provided to the MCU and wherein an interrupt service routine executed by the MCU in response to assertion of the interrupt signal is performed when accesses by masters other than the first bus master to the bus are restricted.
- 20 12. The communication apparatus as recited in Claim 11 wherein the interrupt service routine performs functionality to prepare the digital processing circuit for a shutdown mode of the digital processing circuit.
- 25 13. The communication apparatus as recited in Claim 1 wherein the bus is a multi-layer bus, wherein the first bus master is provided exclusive access to one layer of the bus

in response to assertion of the signal while the one or more other bus masters are allowed access to another layer of the multi-layer bus.

14. The communication apparatus as recited in Claim 6 wherein the shutdown mode  
5 of operation includes disabling at least a portion of the digital processing circuit.

15. The communication apparatus as recited in Claim 6 wherein the shutdown mode  
of operation includes disabling a clock that clocks at least a portion of the digital  
processing circuit.

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16. The communication apparatus as recited in Claim 1 wherein the bus arbiter is  
configured to restrict the granting of ownership of the bus to the one or more other bus  
masters in response to the signal.

15 17. The communication apparatus as recited in Claim 1 wherein the one or more other  
bus masters are configured to inhibit requests to gain ownership of the bus in response to  
the signal.

18. The communication apparatus as recited in Claim 1 wherein accesses by the one  
20 or more other bus masters are restricted by implementing a less favorable arbitration  
policy for the one or more other bus masters in response to the signal.

19. The communication apparatus as recited in Claim 1 wherein accesses by the one  
or more other bus masters to the bus are restricted by terminating burst transfers early in  
25 response to the signal.

20. The communication apparatus as recited in Claim 1 wherein the signal indicative of a change of mode of operation of the RF circuit is generated in response to execution of a software instruction.

5 21. A method of operating a communication apparatus including a radio frequency (RF) circuit and a digital processing circuit, the method comprising:  
arbitrating between requests to access a bus by a first bus master and one or more  
other bus masters;  
receiving a signal indicative of a change in a mode of operation of the RF circuit;  
10 and  
restricting accesses by the one or more other bus masters to the bus in response to  
the signal.

22. The method as recited in Claim 21 wherein accesses by the one or more bus  
15 masters are restricted by implementing a less favorable arbitration policy for the one or  
more bus masters in response to the signal.

23. The method as recited in Claim 21 wherein the signal is indicative of a change to  
an active mode of operation of the RF circuit.

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24. The method as recited in Claim 23 wherein the signal is asserted a predetermined  
amount of time prior to the change to the active mode of operation of the RF circuit.

25. The method as recited in Claim 25 wherein the first bus master is provided  
25 exclusive access to the bus in response to assertion of the signal.

26. A mobile phone comprising:  
a radio frequency (RF) transceiver for operating on a radio frequency signal; and

a digital processing circuit coupled to the RF transceiver, wherein the digital processing circuit includes:

a first bus master coupled to a bus;

one or more other bus masters coupled to the bus; and

5 a bus arbiter configured to arbitrate between requests to access the bus by the first bus master and the one or more other bus masters;

wherein accesses by the one or more other bus masters to the bus are restricted in response to a signal indicative of a change in a mode of operation of the RF transceiver.

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27. The mobile phone as recited in Claim 26 wherein the signal is indicative of a change to an active mode of operation of the RF transceiver.

28. The mobile phone as recited in Claim 27 wherein the signal is asserted a  
15 predetermined amount of time prior to the change to the active mode of operation of the RF transceiver.

29. The mobile phone as recited in Claim 26 wherein the signal is asserted a  
predetermined amount of time prior to a shutdown mode of operation of the digital  
20 processing circuit.

30. The mobile phone as recited in Claim 26 wherein the signal indicative of a change of mode of operation of the RF transceiver is generated by a timing circuit.

25 31. The mobile phone as recited in Claim 26 wherein the first bus master is provided exclusive access to the bus in response to assertion of the signal.

32. A communication device comprising:

a radio frequency (RF) front-end circuit for operating on a radio frequency signal;  
a digital processing circuit coupled to the RF front-end circuit, wherein the digital  
processing circuit includes a first bus master coupled to a bus and one or  
more other bus masters coupled to the bus; and  
5 a bus arbiter configured to arbitrate between requests to access the bus by the first  
bus master and the one or more other bus masters;  
wherein accesses by the one or more other bus masters to the bus are restricted in  
response to a signal indicative of a change in a mode of operation of the  
RF front-end circuit; and  
10 wherein the RF front-end circuit and the digital processing circuit are fabricated  
on a single integrated circuit chip.

33. The mobile phone as recited in Claim 32 wherein the signal is indicative of a  
change to an active mode of operation of the RF front-end circuit.

15 34. The mobile phone as recited in Claim 33 wherein the signal is asserted a  
predetermined amount of time prior to the change to the active mode of operation of the  
RF front-end circuit.

20 35. The mobile phone as recited in Claim 32 wherein the signal is asserted a  
predetermined amount of time prior to a shutdown mode of operation of the digital  
processing circuit.

25 36. The mobile phone as recited in Claim 32 wherein the signal indicative of a change  
of mode of operation of the RF front-end circuit is generated by a timing circuit.

37. The mobile phone as recited in Claim 32 wherein the first bus master is provided  
exclusive access to the bus in response to assertion of the signal.

38. A communication apparatus comprising:  
a radio frequency (RF) circuit for operating on a radio frequency signal; and  
a digital processing circuit coupled to the RF circuit, wherein the digital  
5 processing circuit includes:  
a first bus master coupled to a bus;  
one or more other bus masters coupled to the bus; and  
a bus arbiter configured to arbitrate between requests to access the bus by  
the first bus master and the one or more other bus masters;  
10 wherein accesses by the one or more other bus masters to the bus are  
restricted in response to a signal asserted a predetermined amount  
of time prior to a shutdown mode of operation of the digital  
processing circuit.
- 15 39. The communication apparatus as recited in Claim 38 wherein the first bus master  
is provided exclusive access to the bus in response to assertion of the signal.
40. The communication apparatus as recited in Claim 38 wherein the shutdown mode  
of operation includes disabling at least a portion of the digital processing circuit.
- 20 41. The communication apparatus as recited in Claim 38 wherein the shutdown mode  
of operation includes disabling a clock that clocks at least a portion of the digital  
processing circuit.
- 25 42. A communication apparatus comprising:  
a radio frequency (RF) circuit for operating on a radio frequency signal; and  
a digital processing circuit coupled to the RF circuit, wherein the digital  
processing circuit includes:

a first bus master coupled to a bus;  
one or more other bus masters coupled to the bus; and  
a bus arbiter configured to arbitrate between requests to access the bus by  
the first bus master and the one or more other bus masters  
5 according to an arbitration policy during at least a portion of a  
duration of an inactive mode of operation of the RF circuit;  
wherein the bus arbiter is further configured to implement a less favorable  
arbitration policy for the one or more other bus masters in response  
to a signal indicating a change to an active mode of operation of  
10 the RF circuit.

43. The communication apparatus as recited in Claim 42 wherein the signal is  
asserted a predetermined amount of time prior to the change to the active mode of  
operation of the RF circuit.

15 44. The communication apparatus as recited in Claim 42 wherein the first bus master  
is provided exclusive access to the bus in response to assertion of the signal.

45. The communication apparatus as recited in Claim 42 wherein the first bus master  
20 is a microcontroller unit (MCU).

46. The communication apparatus as recited in Claim 45 wherein an interrupt service  
routine executed by the MCU in response to assertion of an interrupt signal is performed  
when the bus arbiter implements the less favorable arbitration policy for the one or more  
25 other bus masters



47. The communication apparatus as recited in Claim 46 wherein the interrupt service routine performs functionality to prepare the digital processing circuit for a shutdown mode of the digital processing circuit.

5 48. The communication apparatus as recited in Claim 42 wherein the RF circuit and the digital processing circuit are integrated on a single chip.

49. A mobile phone comprising:  
a radio frequency (RF) transceiver for operating on a radio frequency signal; and  
10 a digital processing circuit coupled to the RF transceiver, wherein the digital processing circuit includes:  
a first bus master coupled to a bus;  
one or more other bus masters coupled to the bus; and  
a bus arbiter configured to allow accesses to the bus by the first bus master  
15 and the one or more other bus masters according to an arbitration policy implemented during a first period of operation;  
wherein accesses by the one or more other bus masters to the bus are restricted during a second period of operation in response to a  
signal asserted a predetermined amount of time prior to a shutdown  
20 mode of operation of the digital processing circuit.

50. The mobile phone as recited in Claim 49 wherein the first bus master is provided exclusive access to the bus during the second period of operation.

25 51. The mobile phone as recited in Claim 49 wherein the shutdown mode includes disabling at least a portion of the digital processing circuit.

52. The mobile phone as recited in Claim 49 wherein the shutdown mode includes disabling a clock that clocks at least a portion of the digital processing circuit.

53. A communication apparatus comprising:

5 a radio frequency (RF) circuit for operating on a radio frequency signal; and  
a digital processing circuit coupled to the RF circuit, wherein the digital  
processing circuit includes:

a first bus master coupled to a bus;

one or more other bus masters coupled to the bus; and

10 a bus arbiter configured to allow accesses to the bus by the first bus master  
and the one or more other bus masters according to an arbitration  
policy implemented during a first period of operation;

wherein accesses by the one or more other bus masters to the bus are  
restricted during a second period of operation beginning a  
15 predetermined amount of time prior to an active mode of the RF  
circuit.

54. The communication apparatus as recited in Claim 53 wherein the first bus master  
is provided exclusive access to the bus during the second period of operation.

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55. The communication apparatus as recited in Claim 53 wherein the second period of  
operation is controlled by a timing circuit.

56. The communication apparatus as recited in Claim 53 wherein the bus arbiter is  
25 configured to implement a less favorable arbitration policy for the one or more other bus  
masters during the second period of operation.